BITS Pilani
Pilani | Dubai | Goa | Hyderabad

Post Graduate Program in BIG DATA ENGINEERING

In association with **UpGrad**

11 MONTHS | ONLINE

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BIG DATA
AND ANALYTICS
Industry
IN INDIA
to be worth US$
16 BN
in 2025

Why Big Data

Aadhaar, the world's largest biometric identity system, verifies your identity by processing billions of records; E-Commerce recommendation engines are able to personalize recommendations according to your past search history; Have you ever wondered how these applications are able to process large amounts of data - The answer lies in harnessing the power of Big Data!

A recent study conducted by NASSCOM approximated the Indian Big Data and Analytics Industry to be worth $2 Billion in 2017. The industry is expected to grow to $16 billion, by 2025, with an annualized growth rate of 25%, thus making India one of the top 3 destinations for Big Data & Analytics in the world. This rapid growth is expected to create thousands of Big Data Engineering jobs in the next 3-5 years, presenting significant opportunities for individuals to create their careers and grow!

As per recent hiring trends, skills required in building Big Data applications and platforms (For e.g., technologies like Hadoop & Spark) are sought after in the technology world today. Big Data finds applications across industries - ranging from IT/BPO to E-commerce/Internet to Public Sector. This fast evolving technology presents a promising career path with excellent long term prospects.

Program Outline

Who is this for?

Whether you want to transition into a Big Data Role or acquire the right skill-set to grow in your current role, this program is just right for you

IT & Technology Professionals

Learn about the fundamentals of Big Data and get hands-on exposure to latest tools and technologies to facilitate an easy transition to a promising Big Data Engineering Role

Project Leads & Project Managers in IT/Tech Companies

Learn about Big Data concepts, industry applications, tools and technologies to effectively lead a Big Data Project Team

Current Big Data Professionals

Augment your Big Data knowledge and get a reputed Post Graduate Certification to grow in your industry

Big Data Enthusiasts

Learn about Big Data concepts / applications, tools and technologies, and get a reputed Post Graduate Certification for career growth

What can you expect?

Develop skills in Computer Science & Data Engineering needed to develop Big Data Applications. Also, gain skills in technical problem solving

Post Graduate Certification from BITS Pilani

Upon successful completion of the program, you earn a reputed Post Graduate Certification from BITS Pilani. You also receive a program GPA and official transcript from BITS Pilani

Learn from the best Academic and Industry Faculty

Stay ahead of the curve by learning from BITS Pilani Faculty, Industry leaders and working on industry relevant projects

Hands - on learning opportunity

Master the usage of open source tools and get access to a cloud platform to practice assignments and projects

Career Support

Get access to career coaching services and get introduced to the right opportunities to upgrade yourself

Learning Experience

Strong peer to peer interaction

Be it at school or at our jobs, peers are one of greatest source of learning. This program is hosted on our state-of-the-art UpGrad tech platform, which enables strong peer-to-peer interaction via discussion forums, quizzes, live polls and much more.

Dedicated support to enable learning

Throughout the program, our student success managers and teaching assistants will ensure all your doubts, academic or otherwise, are taken care of.

Get personalized feedback

Get feedback on your industry projects across the entire program and develop your big data skills.

On-the-go Learning

300 hours of learning squeezed into smaller learning sessions; anytime - anywhere

Program Objective

Program Aim

The program aims to prepare aspirants for engineering/ development roles in the Big Data Industry. Learners who pursue this program will acquire the requisite skills in Computer Science and Data Engineering needed by the industry for the development of Big Data Applications. Additionally, learners will also acquire skills of technical Problem Solving.

Preparatory Sessions

If you don’t have previous experience in programming or SQL, don't worry! By enrolling for the program, you get access to pre-program preparatory sessions which will augment your skills in fundamental Computer Science concepts.

Note - Unlike the main program, preparatory sessions are meant to be self-paced. This gives you the chance to revisit topics you are not confident about. You will be provided with assessments, projects and additional reading material to beef up your knowledge before the main program begins.

Prep Sessions begin from **15th Sept, 2017** and they are completely free of cost for all enrolled students

Topics Covered

- Object Oriented Programming (OOP) using JAVA
- Data Structures
- Design and Analysis of Algorithms
- Relational Database Management Systems (SQL)

BITS Pilani reserves the right to edit/ alter the curriculum at a later date based on academic requirements

Program Curriculum

Course 1

Foundations of Big Data Systems

(8 weeks)

In this course you will be given an introduction to Big Data and its common industry applications. You will also develop important foundation in data structures and algorithms that form the basis of the Big Data Systems used in the industry.

Topics Covered:

- Introduction to Big Data and its Applications
- Data Abstraction
- Linear data structures like Hashtables, Hashmaps, Bloom Filters
- Non-linear data structures like Binary Search Trees, KD Trees
- Distributed Algorithm Design
- Algorithm Design using MapReduce

Tools & Technologies Used:

Course Outcomes:

You will be able to select and implement appropriate data structures to solve big data problems and also write Map and Reduce codes for distributed processing of data.

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Course 2

Platforms for Big Data

(8 weeks)

In this course you will be exposed to the different platforms used for processing Big Data. Additionally you will also learn how to set up a virtual machine for processing Big Data on your own computer as well as on the cloud.

Topics Covered:

- Distributed Computing Environment for Big Data
- NoSQL databases for Big Data Storage Applications (HBase)
- Distributed Processing of data using MapReduce & Pig
- In-memory distributed processing using Apache Spark
- Data Storage on Cloud (Amazon S3 & Dynamo DB)

Tools & Technologies Used:

Course Outcomes:

You will be able to perform batch processing operations on Big data on your own computer as well as on an Amazon EC2 instance. You will be able to retrieve and store data in HDFS & Hbase using MapReduce & Apache Pig

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Course 3

Processing Big Data - ETL & Batch Processing

(7 weeks)

Learn about collecting and processing structured and unstructured data by performing ETL operations. Use workflow manager tools to learn automation of task flows.

Topics Covered:

- Performing ETL Operations
- Concepts in Data Warehousing and its relevance for Big Data
- Ingesting data into Big Data Platforms using Sqoop & Flume
- Workflow management for Hadoop using OOZIE
- Batch Processing on Cloud

Tools & Technologies Used:

Course Outcomes:

You will learn to choose and use tools to ingest structured and unstructured data into big data processing systems and use Hive to perform data transformations. You will also be able to process Big Data on Cloud using Amazon EMR and use OOZIE for managing your workflow.

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Course 4

Processing of Real Time Data & Streaming Data

(4 weeks)

Ever wondered how you receive a notification based on your location? The answer lies in exploiting Real Time & Streaming Data. This course will expose you to the exciting world of processing real time data.

Topics Covered:

- Applications of Streaming Data in Industry
- Sourcing Streaming data using Apache Flume
- Building real-time data pipelines using Apache Storm
- Streaming on Apache Spark

Tools & Technologies Used:

Course Outcomes:

You will be able to build real time data processing systems using Apache Storm and Apache Spark

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Course 5

Big Data Analytics

(5 weeks)

In this course you will be introduced to the field of Big Data Analytics and you will learn about the libraries in Apache Spark used to perform Regression, Classification, Clustering on Big Data

Topics Covered:

- Regression, Clustering & Classification using Spark MLLib
- Building visualizations using Big Data
- Case Studies on applications of Big Data Analytics

Tools & Technologies Used:

Course Outcomes:

- You will be able to perform analytics on the big data using Spark MLLib and also get knowledge of tools to visualize results
- Interested students will also have an opportunity to learn the basics of functional programming in Scala*

** denotes an optional topic (over and above curriculum requirement)*
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Course 6

Capstone Project

(6 weeks)

Apply lessons learnt in the program in a project by ingesting, processing and analyzing data on a big data platform in cloud.

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Admissions

Minimum Eligibilty Criteria:

- Employed Professionals with minimum 6 months overall work experience
- Having a minimum 3 years UG Degree with adequate preperation in mathematics and computer programming (e.g. BE/BTech/BSc/BCA*)
- Having minimum 55% marks or 5.5/10 CGPA (on a scale of 10) or 2.2/4 CGPA (on a scale of 4) in UG degree examinations

Admissions Procedure:

To apply: https://upgrad.com/big-data

Post application, we have an admissions process (customised to your profile) to assess your mathematical and programming aptitude.

** In case you don't have any of the above mentioned degrees, but have adequate mathematics and computer programming experience, we encourage you to apply. To get more information, please send an email to bigdata_bitspilani@upgrad.com*

Certification

Get certified by
BITS PILANI & UpGrad

Birla Institute of Technology & Science, Pilani
Pilani Campus

Presents this

Post Graduate Certificate in Big Data Engineering

To Ankush Verma

on Fifteenth of September, Two Thousand Seventeen

Prof. G Sundar
Director, Off-Campus Programmes & Industry Engagement, BITS Pilani

innovate achieve lead

Faculty

Prof. Sundar S Balasubramaniam
Dean - Academics and Resource Planning
BITS Pilani

Dr. Chittaranjan Hota
Associate Dean - Admissions
BITS Pilani

Prof. Nayan Khare
Professor
BITS Pilani

Prof. Vimal SP
Lecturer
BITS Pilani

Dhanashree NP
Lecturer
BITS Pilani

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Post Graduate Program in BIG DATA ENGINEERING

In association with UpGrad

Program Fee: Rs. 2,25,000 (inclusive of taxes)
Batch begins: March, 2018
*Prep sessions starts from 10th November, 2017

For admissions and program related details,
please contact the Chief Admissions Counsellor (Mayank Thaker)
at bigdata_bitspilani@upgrad.com